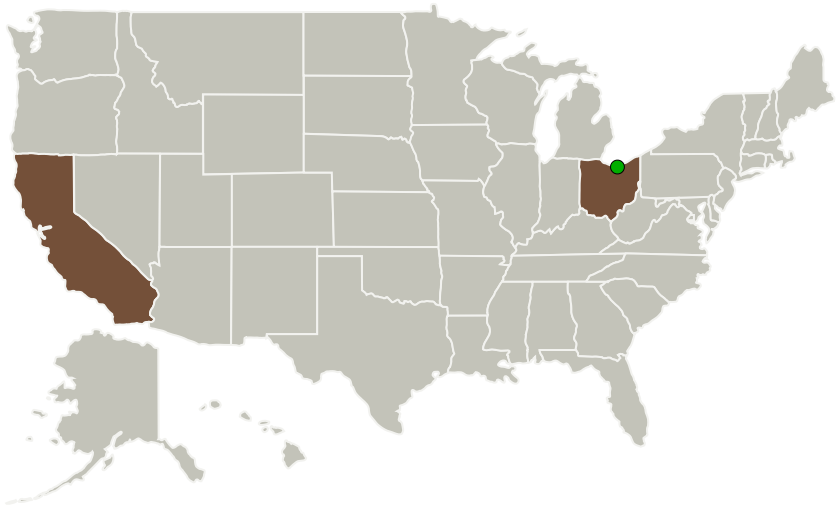
Efficient Lightweight AC-AC Power Control for Solar UAV, Phase I

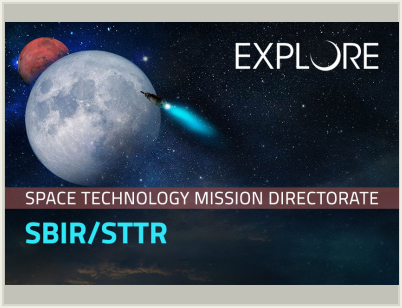
Completed Technology Project (2011 - 2011)

Project Introduction

A highly efficient and lightweight dual bridge matrix power controller development is proposed that will provide high performance to a solar powered high altitude long endurance (HALE) unmanned air vehicle (UAV), Solar Deck 24-7, that can stay aloft for an indefinite period of time (Goal > 5 years) without fuel. This UAV will be able to hover at altitudes greater than 60,000 feet and perform many of the reconnaissance, communications, and scientific data gathering tasks now performed by geosynchronous satellites at an altitude below low earth orbit thus attaining GEO below LEO. In this Phase I R&D effort, we will define the key requirements and develop the preliminary designs for the dual bridge matrix converter for the UAV application. Simulation models will be developed based on the preliminary design to allow assessment of their performance in the UAV application. . At the end of this Phase I R&D effort, we will have advanced the power controller design to the point where we will be ready to perform detailed design and analysis and build and demonstrate prototype unit during the Phase II effort.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Astral Infiniti, LLC	Lead Organization	Industry	Hacienda Heights, California
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
California	Ohio

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138115)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Astral Infiniti, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

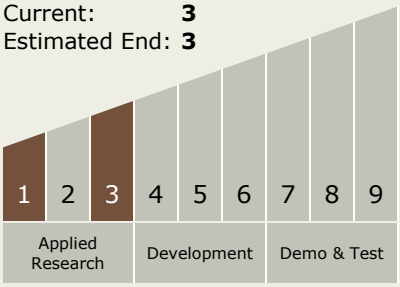
Carlos Torrez

Principal Investigator:

Darwin K Decker

Technology Maturity (TRL)

Start: **1**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
  - TX03.3 Power Management and Distribution
    - TX03.3.3 Electrical Power Conversion and Regulation

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System